WG#3: Beyond CMOS

Addressing the Challenges

- Challenges (address today's infeasible problems)
  - Overcome Semiconductor Limitations--Power, Interconnect, Memory Latency
  - Develop Alternative Models for Computation
  - Develop Alternative Hi Potential Physical/ Biological Mechanisms for Computing
- Novel Approaches
  - Mixed Technology Computer Architectures
    - Hardware/Software
  - Biological/Neuronal Systems

Projected Outcome

- High Performance Computational Node w/Unique Capability
  - lower cost per function
- Easily Distributed Computing Power
  - biological systems
- Create Organized Community
- High Risk/High Payoff

WG#3: Beyond CMOS

Investment Strategy

- DARPA, Industry Support
  - Why DARPA?
    - Unmet Needs Re DARPAs ITO Strategy
  - What other collaborations?
    - Academia with Industry
- What if we did not do this?
  - Don’t accelerate Technology
- Optimal Scale of Efforts
  - Scale to Good Ideas

Other Issues Addressed

- **Infrastructure to support UltraScale Computing Technology Options**

WG#3: Beyond CMOS

Report Summary

- **Revolutionize Computer Engineering with New Computing Models and Implementation Technologies**
  - **biological (neuronal, cellular,DNA)**
  - **quantum computing**
  - **polymer chemistry**
  - **nanotechnology**
  - **optical computing?**
- **Test Against Projected Technology Path For CMOS**